In the Claims:

1. (Canceled)

2. (Currently Amended) A method of predicting exhaust gas temperature at a catalytic converter inlet of an engine at a time of engine restart, wherein the exhaust gas temperature at the catalytic converter inlet of the engine is predicted based on a stored exhaust gas temperature at the time of engine shut-off and an elapsed time between the engine shut-off and the engine restart, ~~The method of claim 1~~, wherein the exhaust gas temperature at the catalytic converter inlet of an engine at the time of engine restart is predicted by the following model:

$$EGT\_CAT\_ST = (EGT\_CAT\_OFF-INT)*K_1+INT$$

wherein

EGT_CAT_ST is an initial exhaust gas temperature at the catalytic converter inlet when the engine is restarted;

EGT_CAT_OFF is the exhaust gas temperature at the catalytic converter inlet when the engine is previously turned off;

K_1 is a time factor determined according to an elapsed time; and

INT is an intake temperature when the engine is restarted.

3. (Original) The method of claim 2, wherein the time factor (K_1) is determined from a predetermined look-up table, by applying the elapsed time.

4. (Original) The method of claim 3, wherein the time factor (K_1) starts from 1 and converges to 0 with an increase in the elapsed time.

5-7. Canceled.

8. (Currently Amended) A method of predicting a steady state exhaust gas temperature at a catalytic converter inlet, comprising:

determining a basic steady state exhaust gas temperature based on an intake air charge rate and engine rpm;

determining a modified steady state exhaust gas temperature by modifying the basic steady state exhaust gas temperature, considering a plurality of variables representing an engine state;

determining a base exhaust gas temperature at the catalytic converter inlet and an exhaust pipe temperature at the catalytic converter inlet based on the modified steady state exhaust gas temperature, considering a time delay; and

determining an exhaust gas temperature at the catalytic converter inlet by summing predetermined weights of the base exhaust gas temperature at the catalytic converter inlet and the exhaust pipe temperature at the catalytic converter inlet,

wherein the plurality of variables includes at least one of catalytic converter temperature, spark advance, air excess rate (λ), and coolant temperature,

wherein the determining a modified steady state exhaust gas temperature by modifying the basic steady state exhaust gas temperature, considering a plurality of variables representing the engine state, is achieved based on a plurality of predetermined look-up tables, and

~~The method of claim 7~~ wherein determining a base exhaust gas temperature at the catalytic converter inlet and exhaust pipe temperature at the catalytic converter inlet is achieved by the following model:

$EGT\_CAT\_BASE = TD\_EG(K_2)*EGT\_ST\_MOD$

$MNFT\_CAT = TD\_MNF(K_3)*EGT\_ST\_MOD$

wherein

EGT_CAT_BASE is the base exhaust gas temperature at the catalytic converter inlet;

MNFT_CAT is the exhaust pipe temperature at the catalytic converter inlet;

TD_EG is a first time delay function with respect to the exhaust gas temperature;

TD_MNF is a second time delay function with respect to the exhaust pipe temperature;

K_2 is a time constant of TD_EG;

K_3 is a time constant of TD_MNF; and

EGT_ST_MOD is the modified steady state exhaust gas temperature.

9. (Original) The method of claim 8, wherein the a time constant of the second time delay function is less than a time constant of the first time delay function.

10. (Original) The method of claim 8, wherein the determining an exhaust gas temperature at the catalytic converter inlet by summing the base exhaust gas temperature at

the catalytic converter inlet and the exhaust pipe temperature at the catalytic converter inlet with predetermined rate is achieved by the following model:

$$EGT\_CAT = K_4 * EGT\_CAT\_BASE + K_5 * MNFT\_CAT$$

wherein

EGT_CAT is the exhaust gas temperature at the catalytic converter inlet;

EGT_CAT_BASE is the base exhaust gas temperature at the catalytic converter inlet;

MNFT_CAT is the exhaust pipe temperature at the catalytic converter inlet;

K_4 is a first weight with respect to EGT_CAT_BASE;

K_5 is a second weight with respect to MNFT_CAT; and

$K_4 + K_5 = 1$.